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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	**Confirmation No. 3451**
Satoshi MAEMORI et al.	:	Docket No. 2003_1422
Serial No. 10/678,259	:	Group Art Unit 1752
Filed October 6, 2003	:	Examiner A. Walke

METHOD FOR THE PREPARATION OF A SEMICONDUCTOR DEVICE

AFFIDAVIT

Commissioner for Patents
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Sir:

I, the undersigned Kazuyuki NITTA, do hereby declare:

THAT I am an employee of Tokyo Ohka Kogyo Co., Ltd., Japan, the assignee of the above-identified United States patent application, since April, 1990, being engaged in the research and development works relative to the chemical-amplification positive-working photoresist compositions and other related products of the company;

THAT, I am one of the joint inventors in the above-identified pending United States patent application, I have full acquaintance with the subject matter of the above-identified pending application, which is a divisional application from a parent application Serial No. 09/939,842 filed August 28, 2001, and have caused the test calculations described below by myself; and

THAT I have a good knowledge of the English language and have read and understood the application papers and the prosecution history of the application and the parent application.

TEST CALCULATIONS

I. Object of the test calculation

In the Preliminary Amendment filed October 6, 2003, the Applicants made Remarks in connection with the rate of film thickness reduction of the resinous compound as the component (B) of the photoresist composition used in the claimed method and argued that the rate specified in claim 1 of from 0.15 to 0.20 nm/second is unique in view of the value of 0.23 nm/second obtained by calculation from the experimental data appearing in the Examples of the Nitta et al. reference.

These arguments, however, were criticized by the Examiner in the Official Action mailed March 4, 2004, who advised the Applicants that this type of objective evidence must be factually supported by an affidavit or declaration.

The object of the test calculations described below is, accordingly, to provide a factual support to the above mentioned arguments relative to the rate of film thickness reduction of the resinous compound.

II. Calculation procedures and results

The Nitta et al. reference contains TABLE 1 on column 22 which summarizes the experimental data in Examples 1 to 9 (9 inventive examples) and Comparative Examples 1 to 3 (3 comparative examples) including the results of the "film thickness retention" test give in %. The results of the film

thickness retention were 98% in each of the 9 inventive examples and 98%, 99% and 96% in Comparative Examples 1, 2 and 3, respectively.

As is readily understood, the rate of film thickness reduction (nm/second) is correlated to the film thickness retention (%) and the former value can be calculated from the latter provided that the conditions for immersion in the aqueous alkaline solution be identical each with the other. As is shown in claim 1 of the present application and column 16, lines 6 et seq. of the Nitta et al. reference, the resinous layer for testing was kept immersed in a 2.38% by weight aqueous solution of tetramethylammonium hydroxide at 23 °C in each of the present invention and in Nitta et al. in which the initial thickness of the resinous layer was 0.7 μm (700 nm)(col. 15, line 29) and the immersion time in the aqueous alkaline solution was 60 seconds (col. 15, line 38).

The above described testing conditions readily leads to a calculation that the 98% film thickness retention means a 2% film thickness reduction of the resinous film initially having a thickness of 700 nm or 14 nm film thickness reduction by a 60 seconds alkali immersion corresponding to a rate of film thickness reduction of (14/60 =) 0.23 nm/second. Similar calculations give the rates of film thickness reduction of 0.12 nm/second and 0.47 nm/second corresponding to the film thickness retention values of 99% and 96%, respectively.

III. Conclusion

The Applicants' arguments for the uniqueness of the rate of film thickness reduction specified in claim 1 over the Nitta et al. reference can be imparted with a support as described above because the 12 resinous layers tested in 9 inventive examples and 3 comparative examples never exhibited the rate of film thickness reduction specified in claim 1.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of any application or any patent issued thereon.

Date: May 28, 2004

Kazuyuki Nitta

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